12AX7-A
TWIN TRIODE

DESCRIPTION AND RATING

The 12AX7-A is a miniature high-mu twin triode each section of which has an individual cathode connection. The 12AX7-A is especially suited for use in resistance-coupled voltage amplifiers, phase inverters, multivibrators, and numerous industrial-control circuits where high voltage gain is desired. A center-tapped heater permits operation of the tube from either a 6.3-volt or a 12.6-volt heater supply.

Use of the 12AX7-A is advantageous in applications that require low hum and microphonic output.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

	Series	Parallel	
Heater Voltage, AC or DC	12.6	6.3	Volts
Heater Current	0.15	0.3	Amperes

Direct Interelectrode Capacitances

	With Shield*	Without Shield	
Grid to Plate, Each Section	1.7	1.7	pf
Input, Each Section	1.8	1.6	pf
Output, Section 1	1.9	0.46	pf
Output, Section 2	1.9	0.34	pf

MECHANICAL

Mounting Position—Any
Envelope—T-6½, Glass
Base—E9-1, Small Button 9-Pin

MAXIMUM RATINGS

DESIGN-MAXIMUM VALUES, EACH SECTION

Plate Voltage	330	Volts
Positive DC Grid Voltage	0	Volts
Negative DC Grid Voltage	55	Volts
Plate Dissipation	1.2	Watts

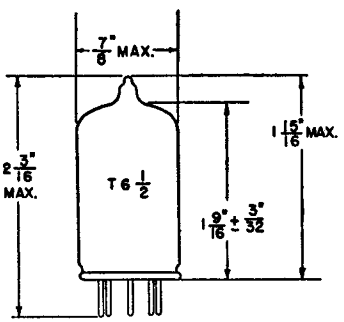
Heater-Cathode Voltage
Heater Positive with Respect to Cathode

DC Component	100	Volts
Total DC and Peak	200	Volts

Heater Negative with Respect to Cathode

Total DC and Peak	200	Volts

PHYSICAL DIMENSIONS

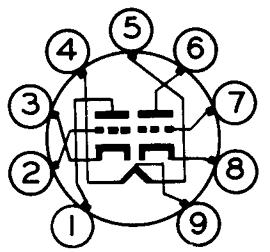


EIA 6-2

TERMINAL CONNECTIONS

Pin 1—Plate (Section 2)
Pin 2—Grid (Section 2)
Pin 3—Cathode (Section 2)
Pin 4—Heater
Pin 5—Heater
Pin 6—Plate (Section 1)
Pin 7—Grid (Section 1)
Pin 8—Cathode (Section 1)
Pin 9—Heater Center-Tap

BASING DIAGRAM



EIA 9A

CHARACTERISTICS AND TYPICAL OPERATION

CLASS A_1 AMPLIFIER, EACH SECTION

Plate Voltage	100	250	Volts
Grid Voltage	−1	−2	Volts
Amplification Factor	100	100	
Plate Resistance, approximate	80000	62500	Ohms
Transconductance	1250	1600	Micromhos
Plate Current	0.5	1.2	Milliamperes
Equivalent Noise and Hum Voltage, Each Section, Average, True RMS†		1.8	Microvolts

* With external shield (EIA 315) connected to cathode of section under test.

† Referred to grid and measured under the following conditions: Ef = 6.3 volts AC (parallel connection), center tap of heater transformer grounded; Ebb = 250 volts, Rb = 100,000 ohms; Rk = 2700 ohms, bypassed with 100 uf; Rg = 0 ohms; amplifier range = 25 to 10,000 cps.

Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

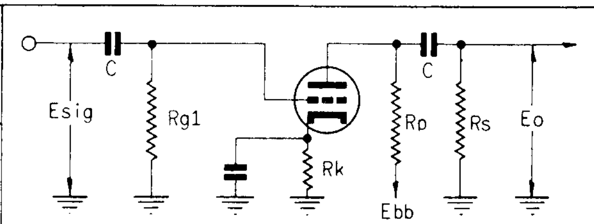
The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making allowance for the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration.

The equipment manufacturer should design so that initially and throughout life no design-maximum value for the intended service is exceeded with a bogey tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all other electron devices in the equipment.

CLASS A RESISTANCE-COUPLED AMPLIFIER

EACH SECTION

Rp Meg.	R_s Meg.	R_{g1} Meg.	Ebb = 90 Volts			Ebb = 180 Volts			Ebb = 300 Volts		
			Rk	Gain	Eo	Rk	Gain	Eo	Rk	Gain	Eo
0.10	0.10	0.1	1700	31	5.0	1000	40	15	760	43	30
0.10	0.24	0.1	2000	38	6.9	1100	46	20	900	50	40
0.24	0.24	0.1	3500	43	6.5	2000	54	18	1600	58	37
0.24	0.51	0.1	3900	49	8.6	2300	59	24	1800	64	47
0.51	0.51	0.1	7100	50	7.4	4300	62	19	3100	66	39
0.51	1.0	0.1	7800	53	9.1	4800	64	24	3600	69	46
0.24	0.24	10	0	37	3.9	0	53	15	0	62	32
0.24	0.51	10	0	44	5.4	0	60	19	0	67	41
0.51	0.51	10	0	44	5.0	0	61	17	0	69	35
0.51	1.0	10	0	49	6.4	0	66	21	0	71	41

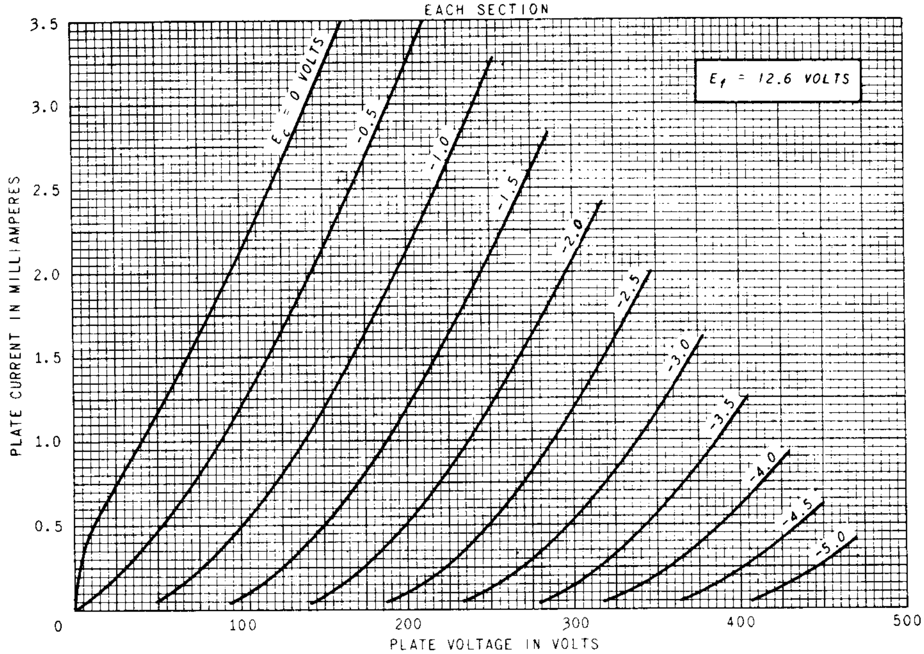


Note: Coupling capacitors (C) should be selected to give desired frequency response. Rk should be adequately by-passed.

Notes: 1. Eo is maximum RMS voltage output for five percent (5%) total harmonic distortion. 2. Gain measured at 2.0 volts RMS output. 3. For zero-bias data, generator impedance is negligible.

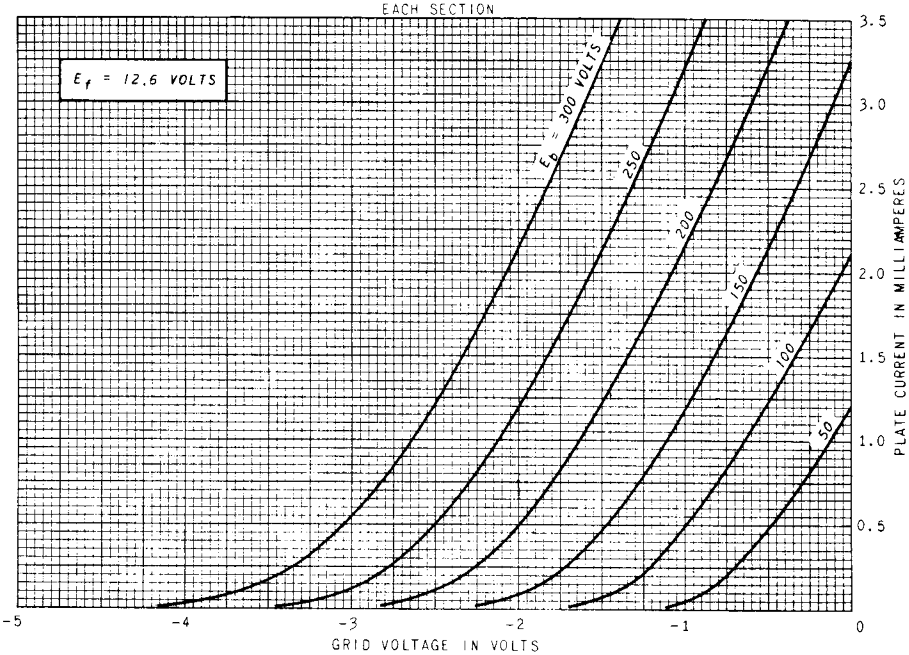
AVERAGE PLATE CHARACTERISTICS

EACH SECTION



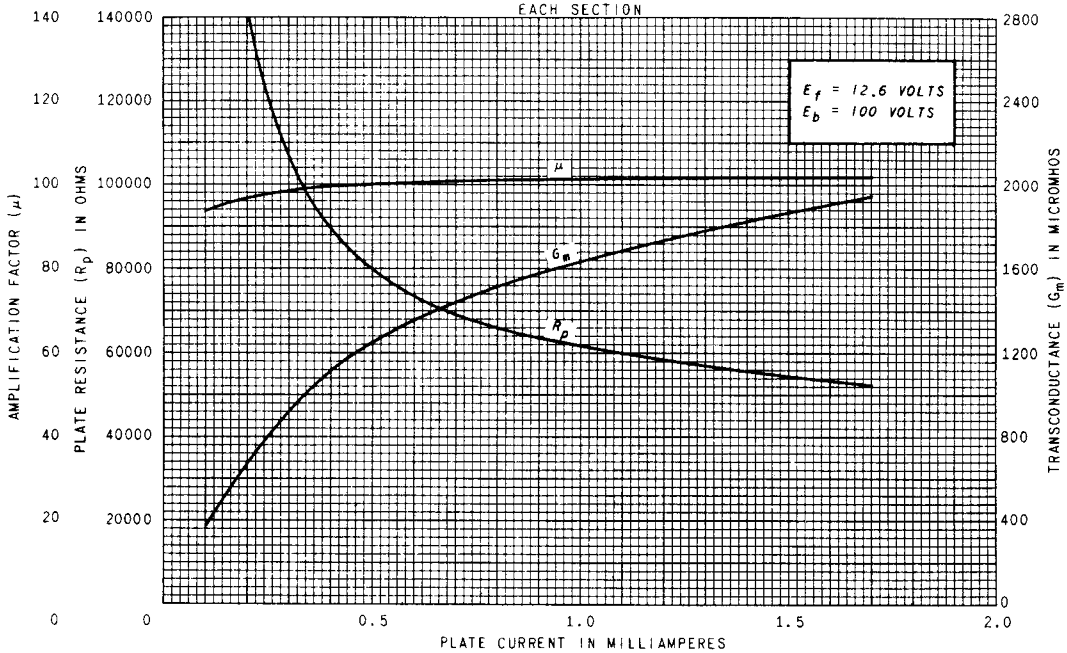
AVERAGE TRANSFER CHARACTERISTICS

EACH SECTION



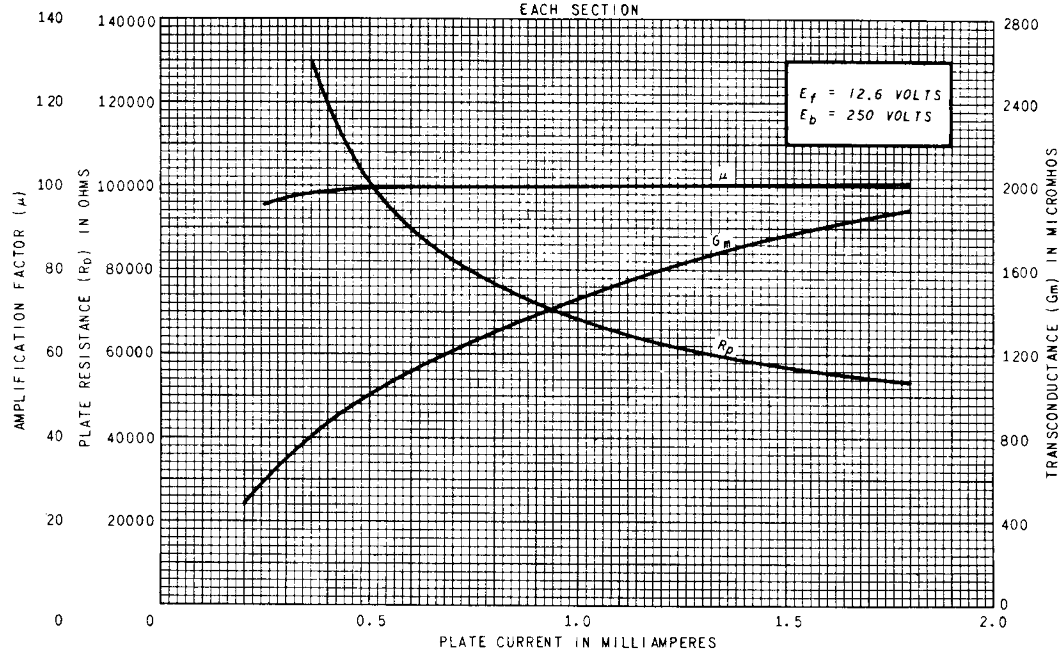
AVERAGE CHARACTERISTICS

EACH SECTION



AVERAGE CHARACTERISTICS

EACH SECTION



RECEIVING TUBE DEPARTMENT

GENERAL ELECTRIC

Owensboro, Kentucky